PATENT
Docket No. ZIN-001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Seeds et al.	CONF. NO.	6908
APPLICATION NO.:	10/538,713	ART UNIT:	2613
FILING DATE:	June 10, 2005	EXAMINER:	D.G. Dobson
TITLE:	Optical Communication System for Wireless Radio Signals		

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COMMENTS ACCOMPANYING REQUEST
FOR PRE-APPEAL BRIEF CONFERENCE

In response to the final Office Action mailed on August 25, 2010, we respectfully submit these Comments:

Remarks begin on page 2 of this paper; and

Conclusion begins on page 5 of this paper.

In accord with the Official Gazette Notice of July 12, 2005, this paper accompanies a Pre-Appeal Brief Request for Review, a Notice of Appeal, and a three-month Extension of Time.

Please charge our credit card for the fees set forth in 37 C.F.R. §§ 41.20(b)(1) and 1.17(a)(3). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith to our Deposit Account No. 07-1700, under Order No. "ZIN-001."

REMARKS

Rejection of Claims 15–21, 23–25 and 27–31 under 35 U.S.C. § 103(a) over Farber, Cunningham

All of the pending claims in this case—independent claims 30 and 31 and the remaining claims that depend therefrom—have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,969,837 ("Farber") in light of U.S. Patent No. 6,064,786 ("Cunningham"). We respectfully disagree.

As described in the specification, embodiments of the present invention transfer radio-frequency modulated optical signals over a multimode fibre. See Application at p. 5, ln. 11–19. Prior art systems utilize either single-mode fibre or multimode fibre where the modulated signal is downconverted to be in the fibre's bandwidth, i.e., the bandwidth specified for baseband transmissions, in order to provide cellular radio or wireless LAN coverage within buildings. See Application at p. 2, ln. 3–6; p. 1, ln. 8–10. In contrast, embodiments of the present invention utilize radio-frequency signals to directly modulate a subcarrier for transmission without downconversion. See Application at p. 8, ln. 6–10. For example, a 2.5 Gbit/s on/off signal can be mixed with a 5.1GHz subcarrier; this occupies—in round numbers—the frequency band 2.6 GHz to 7.6 GHz.

Mobile phone signals and other signals intended to be carried by embodiments of the present invention are inherently narrow band and can appear at nearly any frequency in the band at any time. This means that a defect in the fibre could entirely kill a carried signal utilizing a particular frequency that happens to coincide with the frequencies affected by the defect. As embodiments of the present invention are intended to work with legacy multimode fibre, the frequencies affected by defects are not necessarily known in advance and may vary among fibres.

To address this problem, embodiments of the invention select a particular offset value for the launch and thereby provide a stable operating regime for the whole population of narrowband signals transmitted using a modulated subcarrier over a fibre having defects. Accordingly, each of independent claims 30 and 31 requires: (1) modulating a laser carrier with a radio-frequency signal; (2) launching the laser into a multimode optical fibre at an offset; and (3) the offset being selected to provide a stable operating regime for both amplitude and phase in the face of imperfections in the fibre.

Farber concerns a wireless communication system employing optical fibres. See Farber at col. 1, ln. 4–6. The Office Action concedes that Farber does not expressly disclose the use of an offset launch. See Office Action at 4. Instead, the Office Action relies on Cunningham to teach the coupling of laser-emitted optical radiation into a multimode optical fibre at an offset. See Office Action at 4.

The Office Action claims that it would have been obvious for one of ordinary skill to use the offset launch technique disclosed by Cunningham in the distributed antenna system of Farber. See Office Action at 4. The Office Action also claims that Cunningham teaches selecting an offset to provide a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core, as is required by independent claims 30 and 31. Both of these arguments are clearly erroneous.

No Reasonable Expectation of Success of Combining Farber and Cunningham

The prior art can be modified or combined to reject claims as prima facie obvious as long as there is a reasonable expectation of success. See MPEP at § 2143.02(I). One of ordinary skill would not have a reasonable expectation of successfully combining the offset launch technique disclosed by Cunningham with the distributed antenna system of Farber.

The Cunningham reference exclusively concerns baseband digital bandwidth, and not the transmission of modulated RF signals. See, e.g., Cunningham at col. 7, ln. 9–10 ("data generator 3, operating at 1.0625 GBit/s"), col. 7, ln. 25–26 ("limit transmission at 1GBit/s"); col. 8, ln. 14–16 ("the data generator 3 was stepped from 100 MBit/s to 700 MBit/s, in steps of 100 MBit/s"). As the Office Action concedes, Farber concerns the transmission of modulated RF signals. See Office Action at 3 ("GSM information signal is supplied modulated onto an RF carrier (935-960 MHz)," citing FIG. 3 of Farber).

As the Cunningham and Farber references concern two different fields of endeavor, i.e., improving baseband digital bandwidth versus the transmission of modulated RF signals, we respectfully submit that one of ordinary skill would have no reasonable expectation that the techniques of Cunningham, i.e., increasing the baseband digital bandwidth of a fibre using an offset launch, could be successfully applied to the transmission of modulated RF signals outside the baseband transmission range. Accordingly, any rejection of the pending claims over the combination of Cunningham and Farber is clear error.

Cunningham Does Not Teach or Suggest Selecting an Offset to Provide a Stable Operating Regime for Both Amplitude and Phase in the Face of Imperfections in the Refractive Index Profile of the Core

As has been previously argued, Cunningham transmits information utilizing baseband frequencies, i.e., frequencies from 0 Hz to the highest frequency in the signal having significant power. Accordingly, Cunningham discusses increasing the baseband bandwidth of a multimode fibre beyond its over-filled launch bandwidth using an offset launch. See Cunningham at col. 2, ln. 14–16, col. 3, ln. 3–4, 15–17. Nothing in Cunningham teaches or suggests selecting an offset to provide a stable operating regime for both amplitude and phase in the face of imperfections in the refractive index profile of the core, as is required by each of independent claims 30 and 31.

The only part of Cunningham cited by the Office Action in support of this argument is col. 3, ln. 44–50. See Office Action at 4. This section reads as follows:

> "Embodiments of the present invention thus enable a simultaneous enhancement of both the bandwidth and modal noise performance of a multimode optical fibre communications system relative to an overfilled launch and often also relative to a centre launch."

As is evident from the text, this language neither teaches nor suggests the selection of an offset to provide a stable operating regime for both amplitude and phase in the face of imperfections in the fibre.

Accordingly, the rejection of the pending claims over the combination of Cunningham and Farber is also clear error because such combination neither teaches nor suggests all of the limitations of independent claims 30 and 31 or the claims that depend therefrom.

CONCLUSION

For at least these reasons, the rejection of independent claims 30 and 31 as obvious over Farber in light of Cunningham is clear error. As they are dependent on allowable base claims, dependent claims 15–21, 23–25 and 27–29 are also patentable over Farber in light of Cunningham and are therefore allowable. We request the withdrawal of these rejections.

Respectfully submitted,

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